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| 10/598,641 | 09/07/2006 | Christopher N. Bowman | 40281.0004USWO | 8414 |

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| EXAMINER | |
|---|---|
| KWAK, JAE J | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/598,641 | BOWMAN ET AL. | |
| | Examiner | Art Unit | |
| | JAE KWAK | 4131 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *06 October 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-40* is/are pending in the application.

4a) Of the above claim(s) *1-23* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *24-40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-40* are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *09/07/2006, 10/06/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Election/Restrictions*

1. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1-23, are drawn to dental compositions comprising the polythiols and the polyvinyl.

Group II, claims(s) 24-40, are drawn to a process of preparing dental compositions comprising the polythiol and the polyvinyl.

2. The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: According to international search report the Group I have X relevant references which pertains to the dental compositions.

3. During a telephone conversation with Lewis C. Gregory on December 9$^{th}$ , 2008 a provisional election was made without traverse to prosecute the invention of Group II, claims 24-40. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-23 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

4. The examiner has required restriction between product and process claims. Where applicant elects claims directed to the product, and the product claims are subsequently found allowable, withdrawn process claims that depend from or otherwise require all the limitations of the allowable product claim will be considered for rejoinder. All claims directed to a nonelected

process invention must require all the limitations of an allowable product claim for that process invention to be rejoined.

In the event of rejoinder, the requirement for restriction between the product claims and the rejoined process claims will be withdrawn, and the rejoined process claims will be fully examined for patentability in accordance with 37 CFR 1.104. Thus, to be allowable, the rejoined claims must meet all criteria for patentability including the requirements of 35 U.S.C. 101, 102, 103 and 112. Until all claims to the elected product are found allowable, an otherwise proper restriction requirement between product claims and process claims may be maintained. Withdrawn process claims that are not commensurate in scope with an allowable product claim will not be rejoined. See MPEP § 821.04(b). Additionally, in order to retain the right to rejoinder in accordance with the above policy, applicant is advised that the process claims should be amended during prosecution to require the limitations of the product claims. **Failure to do so may result in a loss of the right to rejoinder**. Further, note that the prohibition against double patenting rejections of 35 U.S.C. 121 does not apply where the restriction requirement is withdrawn by the examiner before the patent issues. See MPEP § 804.01.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

### *Claim Rejections - 35 USC § 112*

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 24-40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 24, lines 2-3, the recitation " polymerizing first polyvinyl monomers in the presence of an excess of first polythiol monomers to obtain polythiol oligomers" causes indefiniteness in views of **Figure 1**., wherein **Figure 1** states that mixing polyvinyl monomers in the presence of an excess of polythiol monomers and then polymerizing to form polythiol oligomers.

Regarding claim 24, line 4-5, the recitation " polymerizing econd polythiol monomers in the presence of an excess of second polyvinyl monomers to obtain polyvinyl oligomers" causes indefiniteness in views of **Figure 1**., wherein **Figure 1** states that mixing polythiol monomers in the presence of an excess of polyvinyl monomers and then polymerizing to form polyvinyl oligomers.

Regarding claim 30, lines 4, does "prepolymerization" mean "oligomerization"?

### *Claim Rejections - 35 USC § 103*

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 24-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Antonucci (US Patent 4,536,523) in view of Hino et al. (US Patent 4,668,712).

Antonucci discloses a process for formulating a dental compositions comprising acrylate monomers or vinyl monomers and polythiols (e.g. multifunctional mercaptans) such as Pentaerythritol tetra(3-mercaptopropionate). (Col. 2 line 53, Col. 3 line 57-60, and Example 1) Furthermore, Atonucci dislcoses alipathic or cyloaliphatic diisocyanates to be included in the dental composite formulations. (Col. 2, lines 39-40)

Antonucci is silent on following:

(1). Prepolymerization vinyl and thiol monomers to form oligomers.

(2). Dental compositions formulations with the photoinitiators.

Referring to (1), it is noted that the present claims are drawn to the prepolymerization of both polyvinyls and polythiols using excess monomers. However the final polythiol oligomers and polyvinyl oligomers are recognized equivalence for the same purpose. Therefore, a Case Law has held that: "It is *prima facie* obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose.... [T]he idea of combining them flows logically from their having been individually taught in the prior art." *In re Kerkhoven*, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980) (citations omitted) (Claims to a process of preparing a spray-dried detergent by mixing together two conventional spray-dried detergents were held to be *prima facie* obvious.). See also *In reCrockett*, 279 F.2d 274, 126 USPQ 186 (CCPA 1960) (Claims directed to a method and material for treating cast iron using a mixture

comprising calcium carbide and magnesium oxide were held unpatentable over prior art disclosures that the aforementioned components individually promote the formation of a nodular structure in cast iron.); and *Ex parte Quadranti*, 25 USPQ2d 1071 (Bd. Pat. App. & Inter. 1992) (mixture of two known herbicides held *prima facie* obvious). MPEP 2144.06

Referring to (2), Hino et al. discloses a photopolymerizable composition suited for dental applications comprising polymerizable monomer and an initiator capable of polymerization, wherein initiator such as camphorquinone photoinitiator is included in the photopolymerizable compositions. (the abstract, and Col. 4, line 43). Furthermore, Hino et al. discloses in Example 1 a process of incorporating camphorquinone into a monomer liquid composition to achieve a high rate curable process and sufficient depth.

In light of such benefits, it would have been obvious to one ordinary skill in are at the time of invention was made incorporate both photoinitiator compositions of Hino et al. in the dental composition formulations of Atonucci.

The recitation of instant claim 32 can be found in Atonucci at (Col. 3, lines 12-13).

The recitation of instant claim 33 can be found in Hino et al. at (Col. 7, line 45).

The recitation of instant claim 34 can be found in Atonucci at (Claim 1)

The recitation of instant claim 35 can be found in Hino et al. at (Col. 4, lines 25-48).

The recitation of instant claim 36 can be found in Atonucci at (Col. 3, lines 58-61).

The recitation of instant claim 37 can be found in Atonucci at (Col. 2, lines 53).

The recitation of instant claims 38-40 can be found in Atonucci at (Example 1).

***Conclusion***

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAE KWAK whose telephone number is (571)270-7339. The examiner can normally be reached on Monday to Friday 8:00 A.M. EST 5:00 P.M. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David R. Sample can be reached on 571-272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ling-Siu Choi/
Primary Examiner, Art Unit 1796

J.K.